Index

Acetylcholine, memory processes in newborn rat 343
Acetylcholine receptors, Helix 73
N-Acetylneuraminic acid
in brain, effect of methylglucamine orotate 255
effect on learning retention performance 229
Active avoidance 93, 105
brain DNA synthesis 190
effect of cholecystokinin octapeptides 381
effect of cyclic nucleotides 183
effect of enkephalins 373
glycoprotein synthesis in goldfish brain 213
effect of 6-hydroxydopamine 325
rats strain difference 203
A-current 44
Adaptive behaviour 303
Adenosine-3', 5'-monophosphate 183
Adenylate cyclase 183
Adrenaline 305, 307
β-Adrenergic receptor, effect of trimethyltin 337
Amethopterin, effect on memory and RNA synthesis in brain 199
γ-Aminobutyric acid, metabolism in brain, effect of ethanol 391
γ-Aminobutyric acid - benzodiazepine receptor 387
Aminosugars 229
Amnesia, novel experiences and memory 363
Amphetamine
cholinergic mechanism in memory effects 347
effect on learning in newborn rats 343
Amphetamine (cont'd)
effect on memory in bees 274
Amygdala, hormone-transmitter interactions 305
Anaesthesia, conditioned taste aversion 277
Analgesia, defeat-induced 295
Anisomycin 174, 176, 178
Antidepressant drugs 383
Antioxidants
effect on cortical LTP 129
effect on kindling 257
Anxiogenic convulsants 387
Aplysia 167, 174
Apomorphine
contralateral rotation in hemidopamine rat 333
effect on memory retrieval 341
Aspartate, release associated with LTP 6, 7
Associative learning, bees 273
Asymmetry, vibrissae removal and crossed nigrostriatal projection 351
Atropine 343
Audiogenic seizures, ethanol withdrawal 391
Autoshaping, trimethyltin impairment 337
Aversive attack stimulus, response in strains of mice 295

B-50, phosphorylation 26
Bee, neuropharmacology of associative learning 273
Benzodiazepines 387
Biogenic amines, in brain, effect of passive avoidance training 315
Brightness discrimination task
effect of carbohydrate precursors of glycomacromolecules 229

Brightness of discrimination task (cont'd)
effect of casamorphin peptides 375
effect of 2-deoxy-D-galactose 223
effect of dopamine agonist and antagonist 341
hippocampal RNA 207
effect of methylglucamine orotate on glycomacromolecules 255
neuropeptide - monoamine effects 329
vasopressin and oxytocin in brain areas 369
8-Bromo-adenosine-3', 5'-monophosphate 183
Bromopyruvate 397

CA1 neurons
calcium-induced LTP 67
transmitter release associated with LTP 5, 8
CA3 neurons
protein synthesis and LTP 79
transmitter release associated with LTP 5, 8
Caffeine 347
Calcium
role in LTP 5, 8, 26, 45, 67
effect on short-term plasticity in Helix cholinoreceptive membrane 73
Calcium - ganglioside complexes, synaptic transmission and memory 235, 241
Carnitine 391
Casomorphin peptides 375
Catecholamines
in brain, deprivation of and learning 325
in brain, effect of passive avoidance training 315
role in memory processes in newborn rat 343
Centedrine 347
Centrophenoxine 347
Chick
biology of learning 168
imprinting 265
three-stage model of memory formation 173, 175
m-Chlorophenylpiperazine 383
Cholecystokinin octapeptides 381
Choline, labeling of brain nucleic acids 199
Cholinergic transmission, memory effects of CNS stimulants 347
Cholinolytics, learning in newborn rats 343
Cholinoreceptive membrane, Helix neurons 73
Clorgyline 277, 279
CNS stimulants, cholinergic mechanism in memory effects of 347
Coated vesicle protein 52 kDa
characterization 35
phosphorylation 29
Colchicine 119
Commissural input/perforant pathway, dentate gyrus 127
Conditioned delayed reactions 143, 146, 148
Conditioned reflex, LTP 13, 23
Conditioned rotation, hemi-dopamine rat 333
Conditioning
anaesthetized rats 277
bees 273
casomorphin peptides 375
cyclic nucleotides 183
enkephalin 373
fucose incorporation in hippocampus 100, 105
Helix, protein in subesophageal ganglia 209
6-hydroxydopamine 325
loss after colchicine injection in dentate area 119
LTP 93
methylglucamine orotate 123
response of locus coeruleus cells 283
submissive postures and escape in strains of mice 295
trazodone 383
vasopressin and oxytocin in brain areas 369
Consecutively processed tasks 360
Contextual cue 283
Corticosterone 315
Crossed nigrostriatal projection 351
Current source density 52, 59, 127
Cyclic nucleotides 183
Cycloheximide 178
Cysteamine
effect on cortical LTP 129
effect on pentylenetetrazol kindling 257
Cysteine, effect on pentylenetetrazol kindling 257

Dalargin 329
Defeat-induced analgesia 295
Defensive conditioned reflex, Helix 209
Dementia 397
Dentate gyrus
different plastic properties of perforant pathway and commissural input 127
loss of conditioning after colchicine injection 119
LTP and transmitter release 7

Dentate gyrus (cont'd)
effect of methylglucamine orotate on field potentials 123
ultrastructural changes accompanying LTP 109
vesicle density following LTP 115
Dendritic depolarization 61
Dendritic tree, field potentials 51, 53
2-Deoxy-D-galactose 223
2-Deoxyglucose, autoradiography or neural paths involved in memory 289
Dihydroalprenolol, effect of trimethyltin on binding 337
Deoxyribonucleic acid, involvement in learning and sleep 189
Dibutyryl cyclic AMP, learning modulation 183
Divergent propagation, hippocampus, entorhinal input 131
Dopamine
in brain, effect of passive avoidance learning 315
conditioned rotation 333
learning in bees 274
memory in newborn rat 343
Dopaminergic behaviour, adaptive responses 303
Dopaminergic receptors, m-chlorophenyl-piperazine action 383
Dopaminergic system, memory retrieval 341
Drosophila 167, 174

Electrocoagulation 143
Elongation factor EF_2 200
Emetine 178
Emotionally negative reinforcement, 6-hydroxydopamine 325
β-Endorphin 357
Engram 244
Enkephalins
effect on LTP in hippocampus 87
role in learning and memory 373
Entorhinal cortex 143, 147, 289
Entorhinal input, divergent propagation of excitation in hippocampus 131
Environment, gangliosides in brain 239
Ependymins 213
Ethanol, neurotransmitter metabolism in brain 391
Escape 295
Evening primrose oil 391
Evolution 401
gangliosides in brain 237

F1 phosphorylation 27
Famous Faces test 363
Field potentials
calcium-induced LTP in CA1 neurons 67
divergent propagation within hippocampus 131
neocortex and sensorimotor cortex, LTP 13, 15
neuron current sources and sinks 52
Food maze behaviour 183
Forskolin 183
Free radicals, role in kindling 257
Frustration, catecholamine deprivation 328
Fucokinase, activity after LTP induction 70
Fucose, incorporation in hippocampus after tetanization and conditioning 105
during LTP 100
impairment of and memory formation 223
Fucose, effect on learning retention performance 229

Galactose, effect on learning retention performance 229
Gangliosides, role in synaptic transmission 235, 247
Genetic model, hippocampal functions 159
Glucose, effect on adrenaline modulation of memory 307
Glutamate
dendritic depolarization 63
effect on memory formation 176
role in LTP 6, 7, 51
Glutamate receptor binding, ganglioside modulation 247
3-Glycin-des-glycil-amid-lysin-vasopressin 329
Glycoproteins
in brain, effect of methylglucamine orotate 255
effect of carbohydrate precursors on learning retention 229
in hippocampus after tetanization and conditioning by perforant path stimulation 105
in hippocampus, fucosylation 71, 223
in hippocampus, post-conditioning LTP 93, 102
role in memory 213, 223
Goldfish, glycoproteins and memory consolidation 213
Granule cell, role in learned behaviour 119
Gustatory trace-poisoning aversion 278

Habituation 85, 229, 358
Haloperidol, memory retrieval 341
Harmaline, conditioned taste aversion under anaesthesia 277, 279
Helix lucorum taurica Kryn 73
Helix pomatia 209

Hermissenda 167
Hibernation, gangliosides in brain 239
Hippocampal graft, rhythmic slow activity in 137
Hippocampus
  effect of bromopyruvate on oxidative metabolism 397
  calcium-induced LTP in CA1 neurons in vitro 67
  divergent propagation of excitation 131
  electrocoagulation of the septum and section on entorhinal cortex 143
  ependymin synthesis and memory 213
  fucose incorporation 100, 105
  glycoprotein fucosylation and memory formation 223
  LTP and intrinsic disinhibition 41
  LTP and opioid peptides 87
  LTP, post-conditioning 93
  LTP, presynaptic mechanisms 5, 22
  LTP, protein synthesis 79
  LTP, spatial aspects 51
  LTP, ultrastructural changes 115
  methylglucamine orotate effect on glycomacromolecules 255
  noradrenaline effects on responsiveness and plasticity 83
  protein 52 kDa characterization 35
  restoration of RSA by brain transplants 137
  RNA synthesis after acquisition of brightness discrimination reaction 207
  role of ganglioside GM1 in synaptic transmission and plasticity 247
  spatial processor hypothesis 159
  vasopressin and oxytocin in and behavioural performance 369
Hippocampal-dependent behavioural trait 159
Histamine, effect on LTP 46
6-Hydroxydopamine
  conditioned rotation 333
  effect on learning and exploratory behaviour 325
Hydroxylamine, effect on kindling 257
5-Hydroxytryptamine
  in brain, effect of passive avoidance training 315
  mediation of conditioned taste aversion 277, 281
  metabolism in brain, effect of ethanol 391
5-Hydroxytryptophan, induced conditioned taste aversion 281
Immobilization, adaptive responses 303
Immunocytochemistry, neurophysin in brain 369
Imprinting 265, 404
Inborn memory 402
Instrumental alimentary reflexes 144, 148
Intermediate-term memory, model 173
Intrinsic disinhibition 41

Kindling 129
  effect of antioxidants 257
Kyotorphin, effect on LTP 87

Learning
  associative, bees 273
  biogenic amines in brain 315
  casomorphin peptides 375
  cell biology, obstacles and progress 165
  cholecystokinin octapeptides 381
  colchicine injection in dentate area 119
  conditioned rotation in hemi-dopamine rat 333
  cyclic nucleotide modulation 183
  DNA involvement 189, 190
  enkephalins 373
  entorhinal cortex section 148
  fucose incorporation into hippocampus 100, 105
  glycoproteins 213, 223
  glycoprotein precursors 229
  habituation to spatial novelty 299
  6-hydrozydopamine 325
  imprinting 265, 268
  locus coeruleus 283
  methylglucamine orotate 123
  model systems 167
  molecular-neuronal level 401
  neuropeptide-monoaminergic interaction 329
  newborn rat, role of acetylcholine and catecholamines 343
  nootropic drugs and paradoxical sleep 151
  paradoxical sleep deprivation 155
  post-conditioning LTP 93, 98
  rat strain differences 203
  social model 295
  trimethyltin effects 337
  vasopressin and oxytocin in brain areas 369
  water-soluble protein in snail ganglia 209
  without awareness 277
Leuzea carthamoides extract 347
γ-Linolenic acid, effect on ethanol altered neurotransmitter metabolism 391
Locus coeruleus 283

Long-term memory 93
model 173
RNA synthesis 207
role of β-endorphin 357
role of glycoproteins 213
Long-term potentiation
calcium-induced 67
conditioning loss after colchicine injection in dentate area 119
cortical, effect of nootropic drugs and antioxidants 129
hippocampal, fucose incorporation 105
hippocampal, presynaptic mechanism 5
hippocampal, spatial aspects 51
intrinsic disinhibition 41
52 kDa characterization 35
methylglucamine orotate effects 123
model for learning? 168
neocortical level 13
noradenaline effects 83
opioid peptides 87
perforant pathway/commissural input in dentate gyrus 127
plasticity model 403
post-conditioning 93
post-synaptic depolarization 61
protein synthesis in hippocampus 79
synaptic protein phosphorylation 25
ultrastructural changes in dentate area 109
ultrastructural changes in hippocampus 115
Major Events test 363
Meclofenoxate 151
Medial hyperstriatum ventrale 169, 266
Medial septum, 2-deoxyglucose radiography after stimulation 289
Medulla, conditioned taste aversion 277, 280
Membrane invaginations 115
Memory
amnestic agents 176
anxiogenic convulsants 387
associative learning in bees 273
biogenic amines in brain 315
casomorphin peptides 375
cell biology, obstacles and progress 165
cholinergic mechanisms in effect of CNS stimulants 347
conditioned rotation in hemi-dopamine rat 333
conditioned taste aversion under anaesthesia 277
2-deoxyglucose autoradiography 289
dopaminergic system 341
Memory (cont'd)
β-endorphins 357
enkephalins 373
gangliosides 235, 243
glucose effect on adrenaline modulation of 307
glycoproteins 213, 223
glycoprotein precursors 229
hormone-transmitter interactions 305
imprinting 265
incubation 179
locus coeruleus 283
long-term 93, 173, 207, 213, 357
medial hyperstriatum ventrale 266
model systems 167
molecular-neuronal level 401
newborn rat, role of acetylcholine and catecholamines 343
neuropeptide-monoaminergic interaction 329
nootropic drugs 151
paradoxical sleep deprivation 155
poly(A)$^+$RNA 195
rat strain differences 203
section of entorhinal cortex 148
three-stage model 173
vasopressin and oxytocin in brain areas 369
Metenkephalin, effect on LTP in hippocampus 87
Methyl β-carboline-3-carboxylate 387
Methylglucamine orotate
effect on field potentials in dentate gyrus and conditioning 123
effect on glycomacromolecules in brain 255
effect in kindled rats 260
effect on paradoxical sleep 151
Methyliodide, effect on seizures in kindled rats 260
Mice strains C57BL/6 and DBA/2, defeat-induced analgesia 295
Molluscan nervous system 167
Monoamine oxidase inhibitors, conditioned taste aversion under anaesthesia 277, 279
Monoaminergic system, role in neuro-peptide effects 329
Monoaminergic transmission, m-chlorophenylpiperazine action 383
Motivation 244

Naloxone
effect on LTP 87
effect on memory 305, 362
Naples High- and Low-Excitability rats 159
brain DNA synthesis 190

Naples High- and Low-Excitibility rats (cont'd)
habituation to spatial novelty 299
Na-selenite
effect on cortical LTP 129
effect on pentylenetetrazol kindling 257
Neocortex, LTP in 13
Neuropeptides 329
Neurophysin 369
Neurotransmitter, LTP 6, 8
Newborn rat, role of acetylcholine and catecholamines in memory 343
Nootropic drugs
effect on cortical LTP 129
effect on paradoxical sleep 151
effect on pentylenetetrazol kindling 257
Noradrenaline
in brain, effect of passive avoidance learning 315
emotionally negative reinforcement 325
effect on LTP 46
effect on memory 305
effect on memory in bees 274
effect on memory in newborn rat 343
effect on responsiveness and plasticity in hippocampus 83
role in imprinting 268
role in neuropeptide effects on learning 329
role in selective attention 283
β-Noradrenergic mechanism, consecutively processed tasks 360
Novel experiences, effect on previously acquired tasks 360, 363

Octopamine, effect on learning in bees 274
Ontogenetic development, gangliosides in brain 237
Opiate-adrenergic interaction, memory modulation 305
Opiate receptors
enkephalin action 373
LTP in hippocampus 87
Opiods
casomorphins 375
defeat-induced analgesia 295
Orotic acid 347
Ouabain 176
Oxytocin, in brain areas, effect of behavioural performance 369

Paradoxical sleep
effect of memory-influencing drugs 151
effect of septal lesion 145
Paradoxical sleep deprivation
effect of memory-influencing drugs 151
effect on passive avoidance learning 155
Pargyline, conditioned taste aversion under anaesthesia 277, 279
Passive avoidance 169
cerebral biogenic amine metabolism 315
effect of paradoxical sleep deprivation 155
rat strain differences 203
Peck inhibition 176, 180
Pentylenetetrazol
effect of antioxidants on kindling 257
effect on memory processing 387
Perforant pathway/commissural input to dentate gyrus 127
Perforant path stimulation
fucose incorporation in hippocampus 105
loss of conditioning after colchicine injection in dentate area 119
effect on methylglucamine orotate on conditioning 123
ultrastructural changes in neurons and synapses 109
Phospholipid, cyclic nucleotide effect on metabolism 186
Phosphorylation, synaptic protein, LTP 25, 35
Physostigmine 199
Picrotoxin 387
Piracetam
effect in kindled rats 260
effect on paradoxical sleep 151
Pituitary, vasopressin in and behavioural performance 369
Plasticity
Helix cholinoreceptive membrane, effect of calcium 73
molecular-neuronal level 401
Poly(A)$^+$RNA 195
Polyphosphoinositides 28
Post-conditioning LTP 93
Post-synaptic depolarization, LTP 61
Potassium, LTP induction 41
Presynaptic mechanisms in hippocampal LTP 5
Presynaptic membrane invaginations, effect of LTP 115
Propranolol 305, 362
Protein
B-50 26
degradation 170
ependymins 213
F1 27
40 kDA 26
52 kDa 29, 35
memory-related synthesis in brain 174, 177

Protein (cont'd)
phosphorylation, cyclic nucleotide effects 183, 186
phosphorylation, LTP 25, 35
S-100 81
synthesis in dentate gyrus, effect of LTP 109
synthesis in hippocampus under LTP 79
water-soluble in snail subesophageal ganglia during learning 209
Protein kinases, calcium-ganglioside activation 241
Pyramidal tract, LTP 13, 21
Pyritinol
effect on corticol LTP 129
effect on paradoxical sleep 151
Pyruvate dehydrogenase
inhibition and memory impairment 397
role in LTP 26

Raphé nuclei, conditioned taste aversion 277, 280
Rat strains, avoidance reactions and RNA in brain 203
Recurrent inhibition 83
Rememberance 244
Retention performance, role of glycoproteins 223, 229
Reverse handedness training 190
Rhythmic slow activity 137
Ribonucleic acid
in brain of different rat strains 203
hippocampal, acquisition of brightness discrimination reaction 207
poly(A)$^+$, role in memory 195
role in learning 189
synthesis in brain, imprinting 266
Ribosomes, dentate gyrus, effect of LTP 109
Rodents, three-stage hypothesis of memory 178
Rotational behaviour, conditioning 333

Scopolamine 343
Seizures, effect of nootropic drugs and antioxidants 257
Selection 404
Sensorimotor cortex, field potentials 13
Sensory stimulation, gangliosides in brain 241
Septal grafts 137
Septal lesion
learning in rat strains 203
sleep-wakefulness cycle 145
Septal neurons, modulation of theta rhythm 141
Septal syndrome 143
Septum
2-deoxyglucose autoradiography following stimulation 289
effect of electrocoagulation on hippocampal electrical activity and memory 143
Septum/striatum, vasopressin and oxytocin in 369
Sequential dependence 174
Shock avoidance 197, 200
Short-term memory, model 173
Simultaneously processed memories 358
Single neuron discharges, LTP 13, 20
Sleep, DNA involvement 189, 191
Sleep-memory interaction 151, 155
Sleep-wakefulness cycle
entorhinal cortex section 147
septal lesion 145
Social isolation, adaptive responses 303
Social learning model 295
Somatostatin 258
Spatial novelty, habituation 299
Spatial processor hypothesis, hippocampal function 159
Spine synapses, vesicle density following LTP 115
S-100 protein, synthesis and distribution after LTP 81
Stress 315
Strychnine 347
Subesophageal ganglia, Helix, proteins in during learning 209
Submissive postures 295
Substantia nigra, vibrissae removal and crossed nigrostriatal projection 351
Suspension grafts 137
Synapses, dentate area, untrastructural changes with LTP 109
Synapsin I 31
Synaptic long-term potentiation
calcium-induced 67
conditioning loss after colchicine injection in dentate area 119
cortical, effect on nootropic drugs and antioxidants 129
hippocampus, fucose incorporation 100
hippocampus, mechanisms 5
hippocampus, spatial aspects 51
intrinsic disinhibition 41
52 kDa characterization 35
methylglucamine orotate effects 123
model for memory? 168
neocortical level 13
noradrenaline effects 83
opioid peptides 87
perforant pathway/commissural input to dentate gyrus 127

Synaptic long-term potentiation (cont'd)
plasticity model 403
post-conditioning 93
post-synaptic depolarization 61
protein phosphorylation 25
protein synthesis in hippocampus 79
ultrastructural changes in dentate area 109
ultrastructural changes in hippocampus 115
Synaptic plasticity 25, 35
role of gangliosides 235, 247
Synaptic protein, phosphorylation, LTP 25, 35
Synaptic transmission, role of gangliosides 240, 242, 247

Taste avoidance learning 176, 180
Tetanic perforant path stimulation
fucose incorporation into hippocampus 105
ultrastructural changes in dentate gyrus 109
Theophylline 347
Thermal adaption, gangliosides in brain 239
Theta rhythm
hippocampus, entorhinal section 143
septal neurons 141
Tissue culture, LTP in 84
α-Tocopherol
effect on cortical LTP 129
effect on pentylenetetrazol kindling 257
Transplantation of neuronal tissue 137
Trazodone 383
Trimethyltin 337

Ultrastructure
dentate area, LTP induced changes 109
hippocampus, LTP induced changes 115

Vasopressin, in brain areas, effect of behavioural performance 369
Vasopressin analogue, effect on learning 329
Vesicle density, spine synapses 115
Vibrissae removal, changes in crossed nigrostriatal projection 351

Y-maze discrimination 151
Yohimbine 284, 286